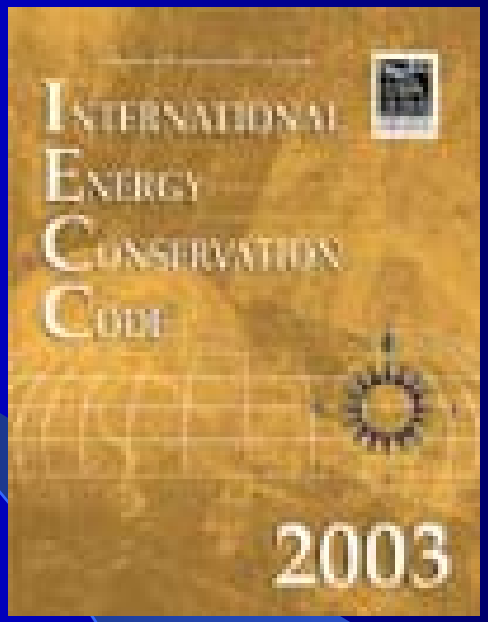
2003 IECC Update

"An Administrative Summary of What's New"



Setting the Standard for Building Safety™

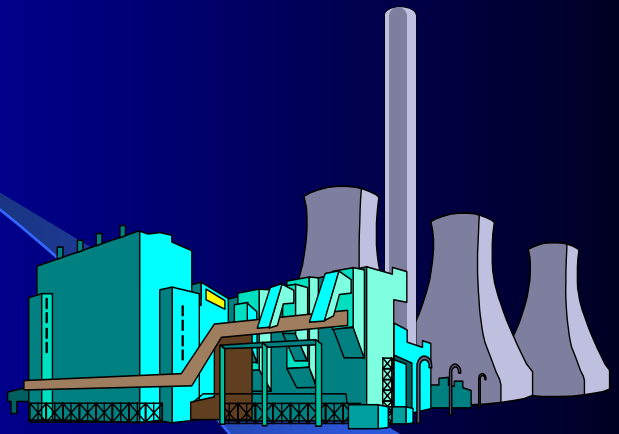
Darren Meyers, PE, CEM
Manager, Contracts & Consulting
DOE National Energy Codes Workshop
June 23rd, 2003

ICC Mission

To promulgate a comprehensive and compatible regulatory system for the built environment through consistent performance-based regulations that are effective, efficient and meet government, industry and public buildings.

*** The ICC, a 50,000-member association dedicated to building safety, develops the codes used to construct residential and commercial buildings, including homes and schools. Through its founders, the ICC has more than 190 years of collective experience developing building safety codes that save lives. The majority of U.S. cities, counties and states that adopt codes choose building and fire safety codes developed by the ICC.**

SBCCI



ICC

INTERNATIONAL CODE COUNCIL

BOCA BUILDING OFFICIALS CODE ADMINISTRATORS INTERNATIONAL ®

INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS ® UNIFORM BUILDING CODE 1922

December 1994 – January 2003

Key Issues Affecting Residential

- Separate Chapter for Climate Maps
- Sunroom Additions
- Correction Factors for Steel Roofs and Floors
- Duct Insulation Simplified
- Listed & Labeled Tapes & Mastics
- Add Moisture Control/Recessed Lighting to Ch 6

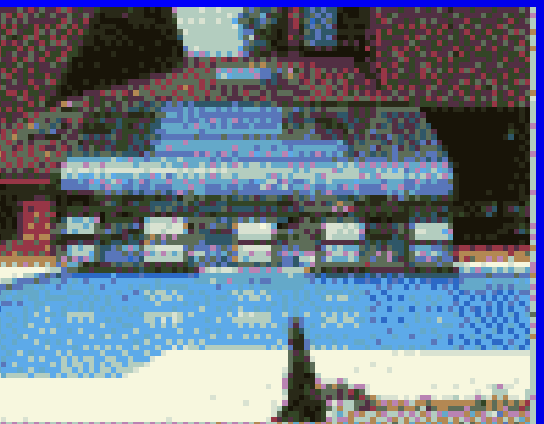
Residential Construction

Detached One- and Two-family Dwellings (Formerly Type A-1)

Multi-family $\leq$ 3 stories and Townhouses (Formerly Type A-2)

Sunrooms vs. Small Additions

- SUNROOM - A one-story addition to an existing dwelling w/ glazing area >40% in exterior walls/roof.
- Additions <500 ft^2 use Table 502.2.5 if:
  - #40% glazing in walls and roof; and
- Conditioned sunrooms use modified Table 502.2.5 if:
  - >40% glazing in exterior walls and roof; and
  - "Thermally isolated"; and
  - Served by separate system OR controlled as separate zone



(Sunrooms) vs. Small Additions

TABLE 502.2.5
PRESCRIPTIVE ENVELOPE COMPONENT CRITERIA
ADDITIONS TO AND WINDOW REPLACEMENT FOR EXISTING ONE- AND TWO-FAMILY

	MAXIMUM	MINIMUM					
HDD	Fenestration *U*-factor [e]	Ceiling *R*-value[a,e]	Wall *R*-value[e]	Floor *R*-value	Basement *R*-value[b]	Slab *R*-value and depth[c]	Crawl space *R*-value[d]
0-1,999	0.75	R-26 (R-19)	R-13	R-11	R-5	R-0	R-5
2,000-3,999	0.50	R-30 (R-19)	R-13	R-19	R-8	R-5, 2 ft.	R-10
4,000-5,999	0.40 (0.50)	R-38 (R-19)	R-18 (R-13)	R-21	R-10	R-9, 2 ft.	R-19
6,000-8,499	0.35 (0.50)	R-49 (R-24)	R-21 (R-13)	R-21	R-11	R-13, 4 ft.	R-20
8,500-12,999	0.35 (0.50)	R-49 (R-24)	R-21 (R-13)	R-21	R-19	R-18, 4 ft.	R-20

Duct Insulation Simplified

IECC TABLE 503.3.3.3
MINIMUM DUCT INSULATION (OLD)

	Insulation R-Value (h ft² °F)			
	Ducts in unconditioned attics or outside building		Ducts in unconditioned basements, crawls, garages & other unconditioned spaces	
HDD	Supply	Return	Supply	Return
< 1,500	8 (3.3– 5)	4 (3.3– 5)	4 (5)	0 (5)
1,500 – 3,500	8 (5 – 8)	4 (5 – 8)	6 (5)	2 (5)
3,501 - 7,500	8 (8)	4 (5)	8 (5)	2 (5)
> 7,500	11 (8)	6 (5)	11 (5)	2 (5)

IRC §N1103.3 DUCT INSULATION

R-5, Inside of building but outside conditioned space

R-8, Outside of building

Key Issues Affecting Commercial

- Additional Infiltration Controls
- Equipment Efficiency Updates
- Economizers required at 65,000 Btu/h
- Additions to Hydronic System Controls
- Heat Recovery for Service Water Heating
- Light Reduction and Override Controls
- Revised Lighting Power Densities
- 90.1-2001 as Equivalent Path for Commercial

Commercial Construction

- **Groups A, B, E, F, H, I, M, High-Rise R, S**
  - Offices, Retail, Grocery and wholesale stores, Restaurants
  - Assembly, Church, Theater & Conference
  - Industrial work buildings
  - Institutional, Hospital or Jail
  - Schools and Churches
  - Theaters
  - Hotels and Motels

Vestibules

Vestibule (air lock) required for:

- Building entrance doors to spaces $\geq$ 3,000 Ft^2
- Must have self-closing devices

Exceptions

- Doors from mechanical, guest room or dwelling unit
- Revolving doors
- Doors primarily for vehicular movement, material handling and adjacent personnel doors

§802.3.5

Other Infiltration Controls

- **Dampers integral to building envelope**
  - Motorized dampers required
    - Stair vents, elevator shaft vents
    - Combustion air ducts
  - Exceptions
    - Smoke/Fire dampers
    - Gravimetric dampers # 3 stories
- **Loading dock weather seals**
- **Recessed lighting**
- **101/IS2/NAFS & NFRC 400**

Photo courtesy of Fairborn Inc.

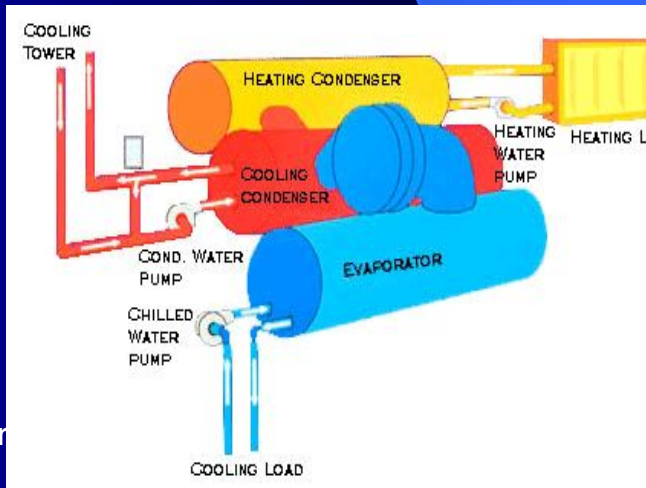
Hydronic System Controls

- Multiple-packaged boiler sequencing required
- Heating boilers >500 kBtu/h shall be
  - Multi-staged; or
  - Modulating burner-type
- Three-Pipe systems prohibited
- Two-Pipe systems shall incorporate measures to minimize impact of changeover
- Hydronic (water-loop) heat pump system optimization

Energy Recovery for SHW

- Condenser recovery to preheat SHW where:
  - Facility operates 24 hrs/day
  - At least 600,000 Btu/h is rejected
    - 400 tons of electric chiller capacity
    - 250-300 tons of gas-fired chiller capacity
  - SHW load exceeds 1 MBh
  - System must recover lesser of:
    - At least 60% of peak heat rejected; or
    - Preheating of peak SHW draw to 85°F
- Exceptions

Courtesy Tri-State Generation and Transmission Association, Inc., http://tristate.apogee.net



Additional Lighting Controls

- **Light Reduction Controls for all spaces**
  - 50% reduction in a "reasonably uniform" pattern
- **Exceptions:**
  - Area having one luminaire
  - Area controlled by occupant sensing device
  - Lobbies, corridors, storage or restrooms
  - Guest rooms and dwelling units
  - Spaces using less than 0.6 W/ft^2

Automatic Lighting Shutoff

- **For Buildings >5,000 ft.² in area**
- **Equipped with automatic controls**
  - Scheduled basis ('Front End' EMS)
    - For areas <25,000 ft.², but
    - Not more than one floor
  - Unscheduled basis
    - An occupant sensing device
- **Occupant Override Required**
- **Equipped with holiday scheduling function**

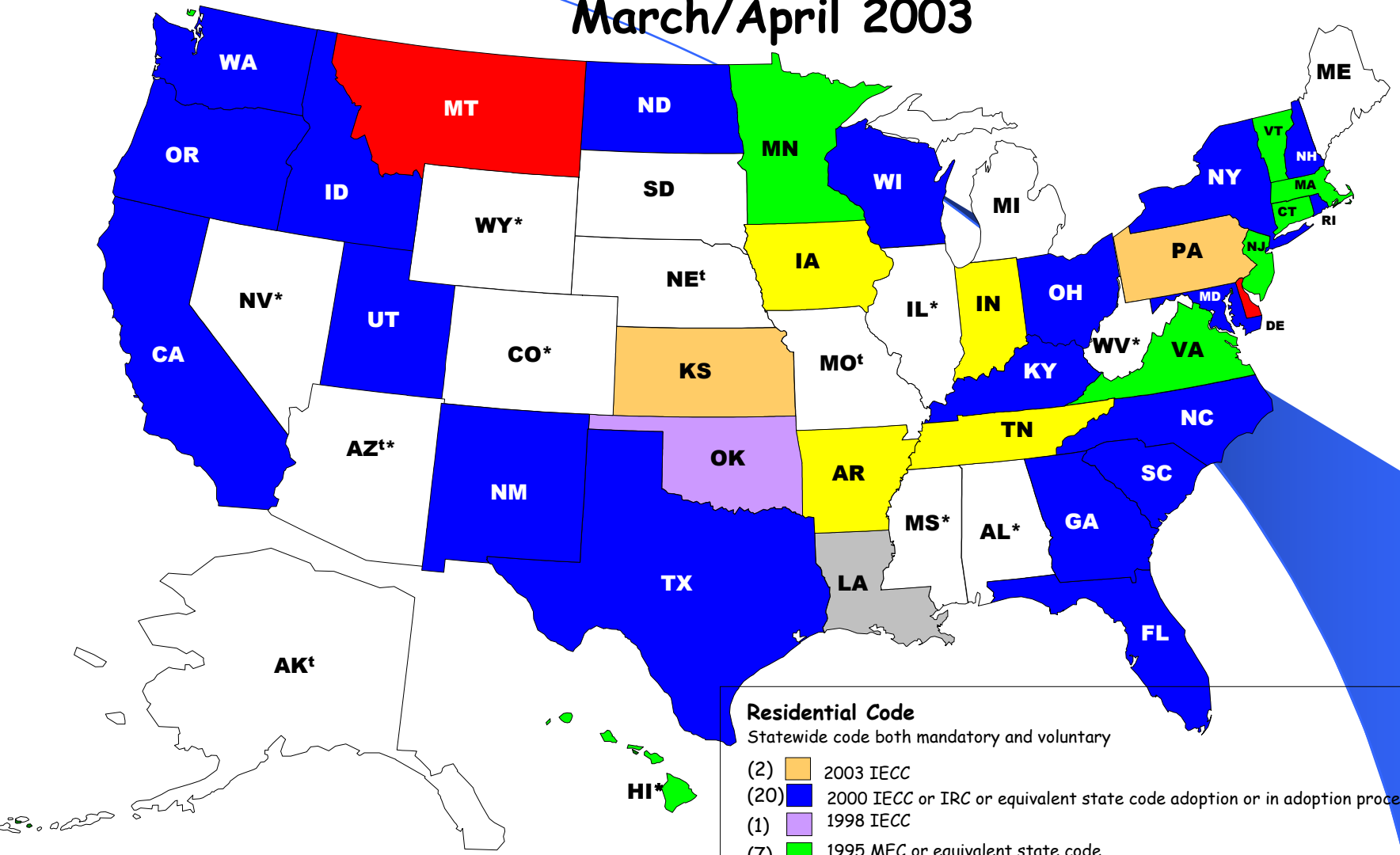
Revised Lighting Power Densities

- Adds twelve new Entire Building power densities
  - Automotive, Convention Center, Court House, Dormitory
  - Hotel Function, Motel, Multi-Family, Parking Garage,
  - Penitentiary, Police/Fire, Post Office, Transportation
- Most power densities (W/ft^2) have decreased
  - Average increase (+8 to 12%), Storage and Theaters
  - Average decrease (-15 to 19%), All others
- Analysis incorporates:
  - Measured fluorescent light loss factors
  - Space type characteristics
  - IESNA Lighting Handbook, 9^{th} Ed.
- Approved by IESNA Technical Committee

46 States Have Adopted ICC International Codes

Residential Energy Code Status

March/April 2003



Residential Code

Statewide code both mandatory and voluntary

(2)	2003 IECC
(20)	2000 IECC or IRC or equivalent state code adoption or in adoption process
(1)	1998 IECC
(7)	1995 MEC or equivalent state code
(1)	1995 MEC or equivalent state code (partial adoption)
(2)	1993 MEC or equivalent state code
(4)	1992 MEC or equivalent state code
(13)	No code or code not EPAct compliant

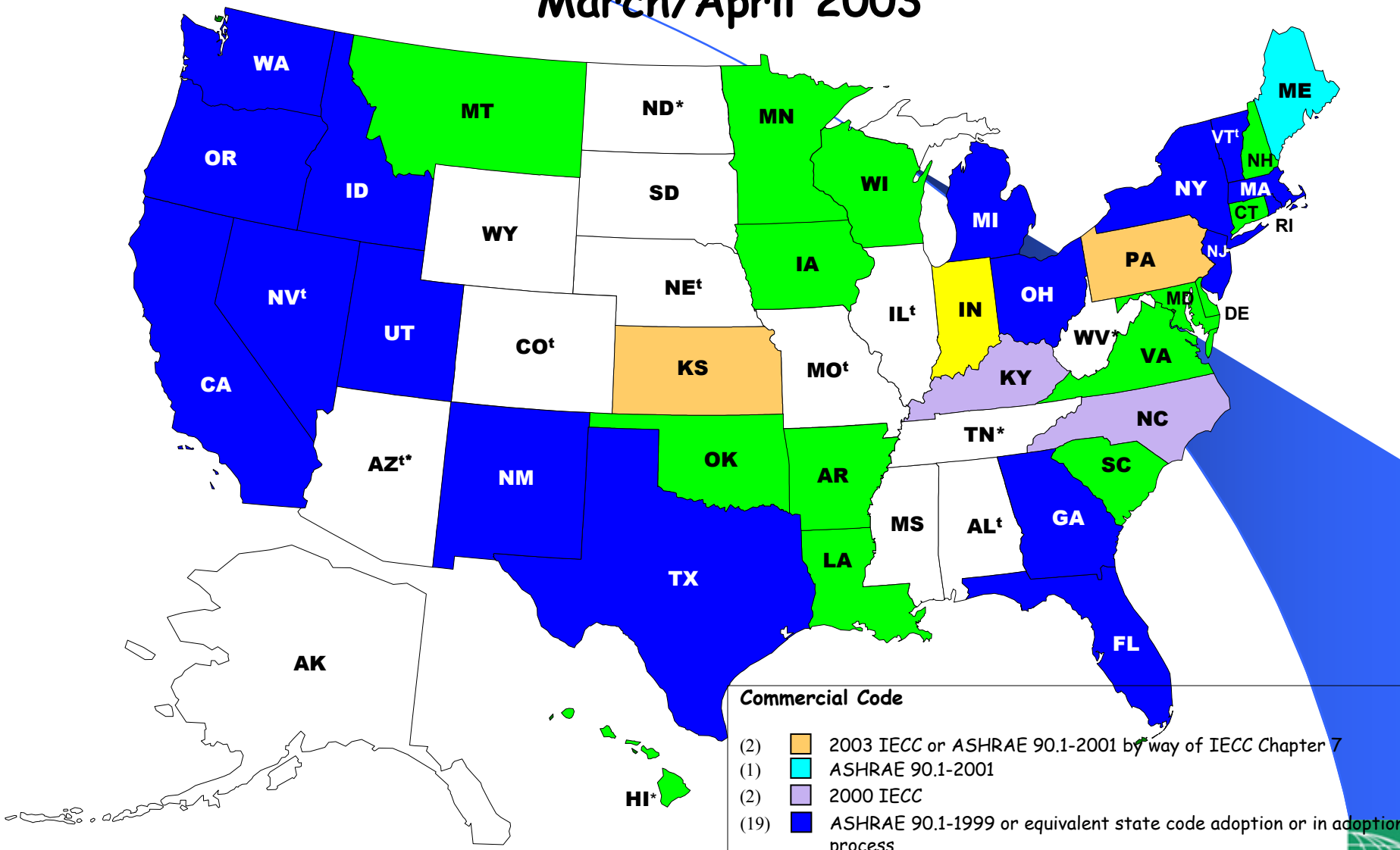
*Code implementation depends upon voluntary adoption by local jurisdictions.

†90.1 Mandatory for state owned residential buildings three stories or less in height.

Courtesy Building Codes Assistance Project
www.bcap-energy.org

Commercial Energy Codes Status

March/April 2003



Commercial Code

(2)		2003 IECC or ASHRAE 90.1-2001 by way of IECC Chapter 7
(1)		ASHRAE 90.1-2001
(2)		2000 IECC
(19)		ASHRAE 90.1-1999 or equivalent state code adoption or in adoption process.
(15)		ASHRAE 90.1-1989
(1)		State developed code does not meet 90.1-1989
(10)		Weaker/None

* Code implementation depends upon voluntary adoption by local jurisdictions.
† Mandatory for State Owned Buildings

Courtesy Building Codes Assistance Project
www.bcap-energy.org

Why Should We Bother to Change Codes and Standards?

They can positively or negatively affect

- Manpower and marketing requirements
- Costs, profit and loss
- Competition and international trade
- Realization of the benefits of the technology

- Industry participation in the ICC *Code Development Process* is essential for complete and comprehensive coverage.
- Education and outreach to the building code, design and construction communities to facilitate adoptions

Summary
2003/04 Code Development

- Deadline for Proposals
  - March 24, 2003
- Proposals Available
  - July 3, 2003
- Code Hearings
  - September 5-14, 2003
  - Opryland Hotel, Nashville
- Report of Hearings
  - November 14, 2003
- Public Comment Deadline
  - April 1, 2004
- Final Action Hearings
  - May, 2004 (Location, TBD)
- 2004 Supplement Issued
  - August, 2004
- 2004-05 Proposals Deadline
  - August 20, 2004